US008054218B2

(12) **United States Patent**
Gelbman

(10) **Patent No.: US 8,054,218 B2**
(45) **Date of Patent: Nov. 8, 2011**

(54) **REMOTELY-ALTERABLE ELECTRONIC-INK BASED DISPLAY DEVICE EMPLOYING AN INTEGRATED CIRCUIT STRUCTURE HAVING A GPS SIGNAL RECEIVER AND PROGRAMMED PROCESSOR FOR LOCALLY DETERMINING DISPLAY DEVICE POSITION AND TRANSMITTING DETERMINED POSITION INFORMATION TO A REMOTE ACTIVATOR MODULE**

(75) Inventor: **Alexander Gelbman**, Mountain Lakes, NJ (US)

(73) Assignee: **Metrologic Instruments, Inc.**, Blackwood, NJ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 4 days.

(21) Appl. No.: **12/154,683**

(22) Filed: **May 23, 2008**

(65) **Prior Publication Data**

US 2008/0309551 A1 Dec. 18, 2008

Related U.S. Application Data

(63) Continuation of application No. 11/196,776, filed on Aug. 2, 2005, now abandoned, which is a continuation of application No. 09/393,553, filed on Sep. 10, 1999, now Pat. No. 6,924,781.

(60) Provisional application No. 60/099,888, filed on Sep. 11, 1998.

(51) **Int. Cl.**
G01S 19/42 (2010.01)
G09G 3/34 (2006.01)

(52) **U.S. Cl.** **342/357.25**; 345/85

(58) **Field of Classification Search** 342/357.06, 342/357.08, 357.13, 357.14; 701/213, 215; 345/2.3, 85; 340/5.91

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,668,106 A 6/1972 Ota
3,756,693 A 9/1973 Ota
3,792,308 A 2/1974 Ota
(Continued)

FOREIGN PATENT DOCUMENTS

EP 1058147 A2 12/2000
(Continued)

OTHER PUBLICATIONS

Nicholas Negroponte, "Surface and Displays", Wired issue No. 3.01, Jan. 1, 1997. 3 pages.
(Continued)

Primary Examiner — Dao L Phan
(74) *Attorney, Agent, or Firm* — Thomas J. Perkowski, Esq., P.C.

(57) **ABSTRACT**

A remotely-alterable electronic-ink based display device for displaying graphical indicia within a GPS system transmitting a plurality of GPS signals to the device display device. The device employs an addressable display assembly including a layer of electronic ink including a bi-stable non-volatile imaging material. The device includes an integrated circuit structure having a GPS signal receiver, a storage element for storing instructions, programs and data, and a programmed processor in electrical communication with the addressable display assembly and an antenna structure. A signal transmitting structure transmits signals from the antenna structure to the remote activator module. A signal receiving structure receives electromagnetic signals from the remote activator module, using the antenna structure. An on-board battery power structure, operably connected to the integrated circuit structure, supplies electrical power the integrated circuit structure. The GPS signal receiver receives GPS signals, and the programmed processor locally processes received GPS signals, determines the position of the display device, and transmits the same to the remote activation module.

21 Claims, 7 Drawing Sheets